

# TELEVISION SYSTEM AND METHOD FOR COMMUNICATION

## NOTIFICATION

### CROSS-REFERENCE TO OTHER APPLICATIONS.

[0001] This application claims the benefit of US  
5 Provisional Application No. 60/281,721 filed April 6,  
2001. Application 60/281,721 is incorporated herein by  
reference in its entirety.

### BACKGROUND

#### Technical Field

10 [0002] The description relates to a system for use  
with television systems allowing notification and  
management of incoming telephone calls via a television  
set.

#### Related Work

15 [0003] Developments in telephone systems now allow an  
incoming call's calling line indicator (CLI) to be  
displayed on a handset or on a screen associated with a  
telephone so that a user can screen calls and decide  
whether to answer them. This has been further extended  
20 by allowing different ring tones to be associated with  
different CLI's and also for names to be associated with  
CLI's.

[0004] To capture CLI's of incoming calls, a device  
in, or connected to, the telephone apparatus at a user's  
25 premises scans the signals of incoming telephone calls  
and obtains the CLI from the incoming signal. This is

then displayed to the user on a display by the telephone.  
US patent numbers 6,049,713 and 5,553,125 discuss such an  
arrangement. These patents are herein incorporated by  
reference for their useful background information on  
5 caller identification.

[0005] However, such arrangements require a user to  
stop whatever it is that he or she is doing and go to the  
telephone or device to decide whether to answer the call  
based on the CLI or other indication. Furthermore, they  
10 require the purchase and installation of specific  
equipment and/or telephone apparatus.

#### SUMMARY OF THE INVENTION

[0006] One object of the present invention, among  
others that will become apparent from the discussion  
15 below, is to provide a CLI or other indication of a  
caller to a user's television set. In one preferred  
embodiment, this is accomplished without any addition to  
existing equipment at a user's premises.

[0007] In one preferred embodiment, the above object  
20 is achieved by installing an intercept unit at a switch  
or an exchange within the telephone network that serves  
the user. When an incoming telephone call directed to  
the user's telephone number is detected, the intercept  
unit obtains the CLI or other caller data and transmits  
25 this to a digital television decoder or other similar  
receiver within the user's house for display on a user's

television. In this manner, a user watching television can decide whether to answer the phone or let voicemail take the call. Further functionality may be offered by allowing the user to use a remote control or the like to redirect the call to voicemail, another telephone or to send an instant message or email in reply to the call.

#### BRIEF DESCRIPTION OF THE DRAWING FIGURE

[0008] The sole Figure is a simplified schematic diagram showing a television system that achieves the aforementioned object.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] Using the above-identified Figure, the invention will now be described with respect to various preferred embodiments. Although many specificities will be mentioned, it must be emphasized that the scope of the invention is not be taken to be that of only the preferred embodiments, but should be construed in accordance with the claims appended below.

[0010] Prior to describing in detail the preferred embodiments, however, certain terms will now be defined for the purposes of this description.

#### Computer System

[0011] One embodiment of this invention resides in a computer system. Here, the term "computer system" is to be understood to include at least a memory and a processor. In general, the memory will store, at one

time or another, at least portions of an executable program code, and the processor will execute more or one of the instructions included in that executable program code. It will be appreciated that the term "executable  
5 program code" and the term "software" means substantially the same thing for the purposes of this description.

[0012] Under this definition, "computer system" encompasses not only the more traditional notions of a computer, but also various other processor-enabled  
10 devices such as a television system, a set-top-box, an application specific integrated circuit, or the like.

#### Computer Program Product

[0013] The above-identified invention may be embodied in a computer program product, as will now be explained.

15 [0014] On a practical level, the software that enables the computer system to perform the operations described further below in detail, may be supplied on any one of a variety of media. Furthermore, the actual implementation of the approach and operations of the invention are  
20 actually statements written in a programming language. Such programming language statements, when executed by a computer, cause the computer to act in accordance with the particular content of the statements. Furthermore the software that enables a computer system to act in  
25 accordance with the described system may provide in a number of forms, including, but not limited to, original

source code, assembly code, object code, machine language, encrypted or compressed versions of the foregoing and any and all equivalents.

[0015] One of skill in the art will appreciate that  
5 "media", or "computer readable media" , as used here, may include a diskette, a tape, a compact disc, an integrated circuit, a ROM, a CD, a cartridge, a memory stick, a remote transmission via a communication circuit, or any other similar medium usable by computers, even those  
10 media hereafter developed. For example, to supply software for enabling a computer system to operate in accordance with the system described herein, the supplier may provide a CD or transmit the software in some form via satellite transmission, via a direct telephone link,  
15 via a cable, or via the Internet. Thus, the term "computer readable medium" is intended to include all of the foregoing and any other medium by which computer software may be provided to a computer system.

[0016] Although the enabling software may be "written  
20 on" a diskette, "stored in" an integrated circuit, "carried over" a communication circuit or "downloaded" via the Internet, it will be appreciated that for the purposes of this description, the software will be referred to as being "on" the computer readable medium.  
25 The term "on" may not linguistically be a perfect fit for ever possible combination of software and computer

readable medium, but it will be appreciated that the term is one of linguistic convenience. Thus, the term "on" is intended to encompass the above and all equivalent ways in which software is associated with a computer readable  
5 medium.

[0017] For the sake of simplicity, therefore, the term "computer program product" is thus used to refer to a computer readable medium, as defined above, which has on it any form of software to enable a computer system to  
10 operate according to certain pre-defined steps.

#### User Interface

[0018] A user interface may be understood to mean any hardware, software, or combination of hardware and software that allows a user to interact with a computer  
15 system. For the purposes of this description, a user interface will be understood to include one or more user interface objects. User interface objects may include display regions, user activatable regions and the like.

[0019] As is well understood, a display region is a  
20 region of a user interface which displays information to the user. A user activatable region is a region of a user interface such as a button or menu, which allows the user to take some action with respect to the user interface.

25 [0020] A user interface may be invoked by an application program. Another application program

invokes user interface, it is typically for the purpose of interacting with a user. It is not necessary, however, for the purposes of this description, that an actual user ever interacts with the user interface. It is also not necessary, for the purposes of this description, that the interaction with the user interface be performed by an actual user. That is to say, it is foreseen that the user interface may have interaction with another program, such as a program created using macro programming language statements that simulate the actions of a user with respect of the user interface.

#### First Embodiment

[0021] With the foregoing definitions in mind, an exemplary embodiment of the invention will now be described.

[0022] A user owns a telephone 10 subscribed to a telephone network 20. The telephone 10 has an associated telephone number that others enter to call the user's telephone 10. The user is also a subscriber to a digital television network 30. The digital television network 30 is in communication with a service transmission system 50. The service transmission system is preferably located at the head-end of the television operator and acts as an intermediary for communications between the television network 30 and the telephone network 20.

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[0023] The term "television network" used herein refers to a television broadcast network which is responsible for the actual transmission of television signals to a television receiver of a user. Examples of  
5 a television broadcast network include a cable television distribution system, a terrestrial television broadcast network, a satellite television distribution system.

[0024] A person, who is typically someone wishing to contact the user and who may be referred to as a distant  
10 party, for the sake of convenience, uses his telephone 100 to call the telephone 10 of the user. The call is passed over the telephone network 20 to a telephone system 110 typically operated by the user's telephone service provider. The telephone system 110 is the  
15 interface that connects the user's telephone 10 to the telephone network and is typically a switch at a telephone exchange (also known as a central office).

[0025] An interception system 130 (described in detail below) is connected to the telephone system 110 to  
20 monitor calls received by the telephone system 110 and to detect calls directed to the telephone number of the user's telephone 10. Upon detection of such a call, the interception system 130 obtains the CLI of the incoming call and transmits this to the service transmission  
25 system 50 along with the telephone number of the user's telephone 10. The service transmission system 50



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determines the identity of the decoder or set-top-box 60 at the user's location from a database 55 that cross-references telephone numbers with set-top-box ID's. The database 55 is maintained by the operator of the service transmission system 50 and/or the operator(s) of the telephone network 20 and/or the television network 30. Each user's telephone number is obtained from the user or telephone network operator. The unique ID for the user's set-top-box is typically obtained from the television network operator.

[0026] The service transmission system 50 transmits a signal (referred to herein as an incoming call indication signal) over the television network 30 to the set-top-box 60 (addressed using the unique ID of the set-top-box 60) indicating the CLI of the incoming call. Upon receipt of the incoming call indication signal, the set-top-box 60 displays an appropriate signal or message on the user's television 70.

[0027] The appropriate signal or message may take various forms, but it will be appreciated that, for the sake of generality, the term "incoming call indication" as used herein refers to any indication displayed on a television screen indicating information about an incoming call. Armed with this incoming call indication, the user can easily choose whether to answer the

telephone 10 without having to actually consult the telephone equipment itself.

[0028] The incoming call indication signal may be embedded within a television program signal for direct display on the television 70 without processing by the set-top-box 60. It also may be a separate signal addressed to a specific software application running on the set-top box 60 or portion of the operating system of the set-top-box 60 that displays an additional window over the current television program displayed on the television.

[0029] The incoming call indication signal may also be displayed by the set-top-box 60 as a message superimposed over the current television program.

[0030] To put it another way, a user interface is provided and is responsive to an incoming call indication signal to provide a display region on the television that includes an incoming call indication based on the incoming call indication signal.

[0031] Preferably, the interception system 130 communicates with SS7 (Signalling System 7) or IN (Intelligent Network) components of the telephone system 110 or any other component that holds the CLI in real-time. Alternatives include communication with a telephone operator's real-time billing system, a follow-me system or any other system that holds a real-time

caller ID. The interception system 130 communicates this with the service transmission system 50 that is preferably located at the head-end of the digital television system in order for the information to be forwarded to the subscriber decoder in real time. Such communication between the interception system 130 and the service transmission system 50 may be via the Internet, a dedicated telephone line, or any other available public or private data communication channel.

10 [0032] The service transmission system 50 or the interception system 130 may maintain a log file of the CLI's of received calls along with details of time, call duration and whether the call was answered, routed to voicemail or other outcome of the call. It will be appreciated, however, that the log file need not include all of the information just mentioned, and may also include other information not described here in this example. For the sake of generality and simplicity, the log file may be thought of and referred to herein as "prior call information". The prior call information may be made accessible to a user at the television 70 making an appropriate request from the set-top-box 60, which may be referred to as a prior call information access request. The set-top-box 60 communicates with the service transmission system 50 to obtain the log from the system 50 or the interception system 130. A suitable

module within the set-top-box 60 receives the log file (in what may be referred to as a prior call information signal), or selected portions, and displays it or the selected portions, to the user on the television 70.

5 [0033] For example, the user interface may include an object that responds to the receipt of a prior call information signal by providing a display region including prior call information. Furthermore, the user interface may include a user activatable region for  
10 sending a prior call information access request.

[0034] The system can support wireless and conventional wireline telephone systems and can be applied to cable television, satellite television, digital terrestrial television or any other sort of  
15 television network in which a signal can be directed to a specific receiver. A database 51 may be maintained at the service transmission system 50 associating names and other data, such as photographs, with known CLI's so that this data replaces or adds to the CLI indication  
20 displayed on the user's television. Furthermore, a telephone operator's database 52 may be accessed by the service transmission system 50 or the intercept system 130 to obtain this data.

[0035] To put it another way, the CLI may be thought  
25 of as system-provided incoming call information. The associated names and other data (non-limiting examples of

which are provided above) may be thought of as supplemental incoming call information or also as "further data". It will be appreciated that in the exemplary embodiment now being described, the incoming  
5 call indication signal comprises of not only system-provided incoming call information, but also supplemental incoming call information. Likewise, the user interface in this instance provided a display region for displaying the supplemental incoming call information.

10 [0036] Communication from the decoder or set-top-box 60 to the service transmission system 50 and in turn to the telephone system 110 may be used to direct the incoming calls to another telephone, voicemail or some other system.

15 [0037] For example, when the CLI indication is displayed on the user's television, the set-top-box 60 may display one or more call management options on screen. Using the set-top-box's remote control, the user can select one of the options such as: redirect to  
20 voicemail or send a message to caller saying "call me later". Alternatively, specific buttons or command sequences within the remote control may correspond to such options removing the requirement for extra controls or data on the television screen.

25 [0038] Once an option is selected and received by the set-top-box 60, the set-top-box 60 sends a call

management message indicating the option selected to the service transmission system 50.

[0039] It will be appreciated that the call management functions described can be realised in the user interface by way of user activatable regions. The call management functions described are exemplary, and many others may occur to those of some familiarity with this technology. It will also be appreciated that the user interface responds to the activation of a user activatable region for call management by taking a responding call management action, such as sending a call management communication message to the service transmission system 50.

[0040] Where the digital television network 30 does not allow two-way communication, such as in the case of digital terrestrial television and digital satellite television, another communication network such as PSTN, SMS, GSM, UTMS, GPRS may be used by the set-top-box 60 to contact the service transmission system 50.

[0041] This other network connection can be a dial-up connection, such as one established on an as-needed basis, or a permanent or semi-permanent connection, such as a DSL or private network connection.

[0042] Upon receiving a call management message, the service transmission system 50 determines the user's telephone number from the database 55 and communicates

with the interception system 130 to control the re-  
routing of the call to another system such as a voicemail  
system. Alternatively, the service transmission system 50  
may request an email or messaging system to send a  
5 communication to the caller.

[0043] The invention has been described in general  
terms, and in very specific terms with retrospect to  
particular exemplary embodiments. The invention is not  
limited to these examples, and the scope of the invention  
10 is to be determined in accordance with the appended  
claims.

[0044] It will be appreciated that, although the  
thrust of the examples has been in the home environment,  
other scenarios are possible. That is to say, that it is  
15 easy to generalise from the present set of exemplary  
embodiments from the home environment to an office  
environment in which telephones are typically used in  
close proximity to display units of networked computers.  
Thus, the telephone system of a business could similarly  
20 be monitored by a server on the business' network and  
incoming call information could be provided on the  
display of a network user by a pop-up window or the like.  
Such incoming call information could of course include  
not only the system-provided information but also  
25 supplemental information as mentioned above.

[0045] Furthermore, with the advent of home users connecting their computers to the Internet via cable modems and the like, incoming call indication could also be displayed on the home computer display of the user.

5 [0046] Likewise, although the set-top-box has been described as being separate from the television display, it could also easily be integrated within a television such as in the case of integrated digital televisions. It will also be understood that the software instructions  
10 for permitting a set-top-box, service transmission system, telephone system, or other computer system to operate according to the invention may be supplied using a computer program product as defined above.

[0047] The problems solved above relate to the home  
15 environment, but the solution to the problems with the convenient access to incoming call information could be applied to other areas as well, even factory environments.

[0048] The present system and invention are applicable  
20 to all types of television decoders, including integrated televisions and set-top-boxes. Furthermore, the system described herein, is simpler at least in terms of installation at the users premises, than prior CLI systems because no additional equipment is required to be  
25 installed or maintained at a users premises.



[0049] Other variations will occur to those familiar with this field, and may be made without departing from the scope and spirit of the invention.

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